

<b>SUBJECT:</b>	Fermilab Assessment Manual – Chapter 4 Independent QA Assessment Procedure – Form 2	<b>NUMBER:</b>	3902.1004 FORM 2
<b>RESPONSIBILITY:</b>	Quality Assurance Manager	<b>REVISION:</b>	001.4
<b>APPROVED BY:</b>	Head, Office of Quality and Best Practices	<b>EFFECTIVE:</b>	11/15/2011

<b>Fermilab Independent QA Assessment Report</b>	
<b>Assessment Number &amp; Title:</b> 12-QA-012 ES&H-Work Processes	<b>Version: 001</b>
<b>Date(s) of Assessment:</b> 04/30/12 – 05/03/12	
<b>Performing Organization:</b> Office of Quality & Best Practices	
<b>Assessed Organization(s):</b> Environment, Safety and Health (ES&H) including the following: <ul style="list-style-type: none"> <li>• Radiation Protection Group, Radiation Physics Team</li> </ul> <p>As described by the Nuclear Materials Representative (NMR), the ES&amp;H Section Radiation Physics Team supports Fermilab through management of the Radionuclide Analysis Facility, management of the Fermilab Dosimetry Program, and support for science experiments. The Team is responsible for review of shielding assessments, shielding calculations, interlock reviews, laser safety, Radiological Control Technician training, management of the Radioactive Source Control and Accountability Program, management of the Nuclear Materials Control and Accountability Program, and ALARA coordinator activities.</p>	
<b>Assessment Activities &amp; Scope:</b> <p>Implementation and effectiveness of work process controls described in IQA chapter 5 and Fermilab and ES&amp;H policies and procedures related to nuclear materials control processes were examined via interview, observation, and document review.</p> <p><b>Scope Limitations:</b></p> <p>Facilities management, maintenance, readiness reviews and work environment activities were excluded.</p> <p><b>Activities Reviewed Within this Assessment:</b></p> <ul style="list-style-type: none"> <li>• Nuclear Materials Program Management</li> <li>• Nuclear Materials Control</li> <li>• Nuclear Materials Accounting</li> <li>• Nuclear Material Reports</li> <li>• Nuclear Material Physical Inventory</li> </ul> <p><b>Description of the Implementation &amp; Effectiveness of Observed Activities:</b></p> <p><u>Work Processes</u></p> <p>The requirements of IQA Chapter 5, Work Processes, as related to Nuclear Materials Controls &amp; Accountability requirements are met and are effectively implemented within the Environment, Safety and Health Section's local procedures. The assessment concentrated on the NMRs since they are responsible for implementing the Nuclear Materials Control and Accountability Program.</p> <p>The following material transfer controls were evaluated and found to be in compliance with Sections 3.d, 5.c &amp; 5.f of the Materials Control &amp; Accountability (MC&amp;A) Plan, FNAL MC&amp;A-1.</p>	

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- Nuclear Materials Inventory Adjustment Log, File01
- Nuclear Materials Transaction Log, File02
- On-site Transfer of Nuclear Materials Form (R.P. Form # 57), File03
- On-site Transfer Log, File04
- Record of Radioactive Receipts and Shipments (R.P. Form # 20), File05
- Nuclear Material Transaction Report (DOE/NRC Form 741), File06
- Nuclear Material Inventory Adjustment form (R.P. Form # 79), File07

Discussion and direct observation with the NMR confirmed that nuclear materials shipment data is entered into the Uranium and/or Radioactive Source (Oracle) database (File08). The database is password protected, and contains information specified in section 5.c of the MC&A Plan.

Nuclear material transaction data is entered into the Safeguards Management Software (SAMS), File09. The SAMS data file is sent to the Nuclear Materials Management and Safeguards System (NMMSS) via Entrust<sup>TM</sup> encrypted email program. Observation and conversation with the NMR demonstrate that the Safeguards Management Software Data Entry Procedure, FNAL MC&A-4 is being followed for entering nuclear materials transaction data into SAMS.

Review of the section 5.g, MC&A Plan and the person interviewed confirmed that if a shipping discrepancy occurs, the NMR or NMR Alternate notifies the shipper to resolve the problem. If the discrepancy cannot be resolved, the DOE Fermi Site Office is contacted to report the shipper/receiver difference.

Interviews with the NMR and examination of the five required reports specified in Section 6, Nuclear Material Reports of the MC&A Plan corroborated that the reports are being completed on time and as specified. The reports are:

- Nuclear Material Allotment Forecast Report, File10
- Nuclear Materials Management Plan (NMMP) , File11
- Nuclear Material Balance Report (MBR) , File12
- Nuclear Materials Inventory Assessment (NMIA) Report, File13
- Review of Inventory Adjustments Report, File14

Conversation with the NMR and observation of the process show that the NMIA Report, Instruction for Table, FNAL MC&A-5 is being followed for creating the Report.

Review of the latest Safeguards and Security Nuclear Materials Control and Accountability Program Self-Assessment Report revealed that programmatic functions were completed on time and in conformance with Section 2.m, Nuclear Material Reports of the System Assurance of the MC&A Plan.

The assessment team verified that sealed neutron sources are stored inside Cave One of the Radiation Physics Calibration Facility (RPCF) where an intrusion alarm system is installed. Conversation with the NMR revealed that keys to the outside door of RPCF are issued only to authorized select ES&H personnel and that the intrusion alarm system sets off a FIRUS (Fire and Utilities) alarm at the Fermilab Communications Center. This was corroborated by the Instrumentation Team Co-Supervisor. Access controls, containment and surveillance requirements are being met as described in Section 3.c of the MC&A Plan.

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Physical inventory was performed that included Depleted Uranium at the DZero Calorimeter, DZero Cryostat, NM4 Hadron Calorimeter, and the Deuterium tanks at the Railhead. The inventoried items count is accurate compared to the latest Nuclear Materials Location Listing, File15. NMR interviews indicated that no nuclear material abnormal situations or loss mechanism exist other than normal operational loss as identified in the MC&A Plan.

Training records (Files16 & 17) indicate that both the NMR and NMR Alternate are current on the required training as indicated in Fermilab Materials Control & Accountability, Task Analysis & Training Needs Assessment, FNAL MC&A-2. A Training Approval Program (TAP) Self-Evaluation Checklist is documented per DOE Training Approval Program requirements outlined in The Self-Evaluation Matrix for Nuclear Materials Control and Accountability (FNAL MC&A-3). On-the-job training for the NMR Alternate is validated and documented on R.P. Form # 100, Fermilab Nuclear Material Control and Accountability Program On-The-Job Training Validation Form as indicated in the MC&A Plan, FNAL MC&A-1.

#### **Conclusions:**

Work process requirements identified in IQA chapter 5 and Fermilab Nuclear Materials Control & Accountability processes are being followed. Review of the material control and accounting requirements along with the data logs, records and reports show compliance with the requirements. Furthermore, this report fulfills the requirements of a Fermilab biennial self-assessment of the Nuclear Materials Control and Accountability Program.

#### **Findings:**

1. None

#### **Observations and Recommendations:**

1. **Observation:** Materials Control and Accountability Plan, FNAL MC&A-1, Section 2.m, Program Review and Assessment section, Bullet 7 states “Performance testing conducted by facility operator.” This is understood as physical inventory; although physical inventory is addressed in bullet 10.  
**Recommendation:** Contact other laboratories with similar nuclear material to determine how “performance testing” is defined.
2. **Observation:** Multiple files are used to track an item back to its Purchase Requisition.  
**Recommendation:** Add purchase requisition number column to the Nuclear Materials Transaction Log.
3. **Observation:** Two separate training records exist for the NMRs. DOE required training records and Fermilab training records.  
**Recommendation:** Add DOE Training Records for NMR and NMR Alternate to their ES&H Train and ITNA.
4. **Observation:** The following issues were noted in Fermilab Materials Control and Accountability, Task Analysis & Training Needs Assessment, FNAL MC&A-2.

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- a) Introduction to Nuclear Materials Control and Accountability CBT is referred to as MCA-101D in the body of the document, but referred to as MCA 101-1 in attachment 2.
- b) Attachment 2, MCA 101-1 training is confusing, divided into two separate sections.
- c) Conversation with the NMR indicated that Vulnerability Assessment Overview, CTA-139 training does not need to be included in Attachment 2.

**Recommendation:**

- a) Correct the course number for the CBT.
- b) Combine the two MCA 101-1 training blocks in Attachment 2
- c) Remove Vulnerability Assessment Overview, CTA-139 from Attachment 2.

5. **Observation:** Safeguards Management Software (SAMS) Data Entry Procedure, FNAL MC&A-4 is divided into 3 sections, A, B & D.

**Recommendation:** Change to A, B & C.

**Commendable Practices:**

- 1. None

**Persons Interviewed:**

Kathy Graden  
Butch Hartman

**Documents Reviewed:**

- Fermilab Nuclear Materials Program, Materials Control and Accountability (MC&A) Plan FNAL MC&A, Rev 1, April, 2012
- Fermilab Materials Control and Accountability, Task Analysis & Training Needs Assessment FNAL MC&A-2, Revision 5, March 2012
- Fermilab Training Approval Program Checklist, FNAL MC&A-3, Revision 5, March, 2012
- Safeguards Management Software (SAMS) Data Entry Procedure, FNAL MC&A-4, Revision 4, March, 2012
- Fermilab Nuclear Material Inventory Assessment (NMIA) Report Instructions for Tables, FNAL MC&A-5, Revision 5, March, 2012
- Second Quarter Fiscal Year 2012, Safeguards and Security Nuclear Materials Control and Accountability Program Self-Assessment Report

**Attachments:**

- File01, INVENTORY ADJUSTMENT LOG.pdf
- File02, INVENTORY TRANSACTION LOG.pdf
- File03, LITHIUM-6 ON-SITE TRANSFER SITE 40 TO LAB B.pdf
- File04, ON-SITE TRANSFER LOG.pdf
- File05, EXAMPLE OF RADIATION PHYSICS FORM 20.pdf
- File06, NUCLEAR MATERIAL TRANSACTION FILE FZF-CWA-11.pdf
- File07, INVENTORY ADJUSTMENT FORM 06-06-01.pdf
- File08, SAMS DATA FILE FOR LITHIUM-6 741 RECEIPT DATA.pdf
- File09, ORACLE URANIUM DATABASE DATA ENTRY SCREEN.pdf

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- File10, FY2012 Fermilab Allotment Forecast Signed.pdf
- File 11, 2011 Signed Nuclear Materials Management Plan.pdf
- File12, FERMILAB MATERIAL BALANCE MARCH 2012 SIGNED.pdf
- File13, FY 2011 FERMILAB CWA NMIA.laccdb
- File14, FY 2011 Annual Review of Inventory Adjustments Signed.pdf
- File15, MAY 2012 NUCLEAR MATERIALS LOCATION LISTING.xlsx
- File16, KGRADEN NUCLEAR MATERIALS TRAINING LOG.xls
- File17, SMCGIMPSEY NUCLEAR MATERIALS TRAINING LOG.xls

**Standards, Regulations, and Other Program Requirements Applied:**

The specific criteria applied to this assessment were:

1001 Fermilab Integrated Quality Assurance (IQA) revision 2, Chapter 5 – Work Processes

**Corrective Action Plans Issued:**

None

**Assessors' Names (asterisk indicates team leader):**

- Michael Pakan\* - OQBP
- Frank Cesarano - BSS

**Submitted by:** : Michael Pakan

**Date:** 5/15/12

**Distribution (Distribute to assessed organizations' management, OQBP head, and other interested parties):**

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